Claims

[1] A region extraction method for extracting a specified region in an image including:

(a) a step for displaying the image;

(b) a step for selecting a desired region in the image;

(c) a step for selecting an element graphic corresponding to at least a partial contour of a partial region in the desired region;

(d) a step for approximating at least a partial contour of the element graphic to at least a partial contour in the partial region;

(e) a step for repeating the steps (c) to (d) at least twice; and

(f) a step for making a first contour by combining at least a partial contour of the respective element graphics after the approximation.

[2] The region extraction method according to claim 1, wherein the step (c) is for selecting the element graphics passing through a plurality of points being placed on at least a partial contour of the partial region or the vicinity of them.

[3] The region extraction method according to claim 1, wherein the step (c) is for selecting the element graphics passing through one or more curves being placed on at least a partial

contour of the partial region or the vicinity of them.

[4] The region extraction method according to claim 1, wherein at least either size or shape of two or more of the plurality of element graphics is different from one another.

[5] The region extraction method according to claim 1, characterized in that a shape of the element graphic is an ellipse.

[6] The region extraction method according to claim 5, wherein step (d) is for implementing the approximation by changing the position, size or shape of the ellipses by moving the major axis point, minor axis point or center point of the ellipses or rotating the ellipses around the center point.

[7] The region extraction method according to claim 5, wherein the step (d) is for implementing the approximation by mutually interlocking at least said two ellipses.

[8] The region extraction method according to claim 1, wherein the step (c) is for displaying the element graphic with the image, and step (d) is for implementing the approximation of the displayed element graphics on the image.

[9] The region extraction method according to claim 1, wherein the following steps are included between the step (b) and the step (c):

(g) a step for displaying at least one patterned graphic formed by a plurality of element graphics being

combined;

(h) a step for selecting the one patterned graphic corresponding to the desired region;

(i) a step for displaying at least one of the plurality of element graphics configuring the selected patterned graphic along with the image, and

in the step (c), the selection of an element graphic from the displayed element graphics is implemented.

[10] The region extraction method according to claim 1, wherein the following steps are included after the step (f):

(j) a step for obtaining a second contour based on the first contour; and

(k) a step for extracting the region including a stratified region held between the first contour and the second contour.

[11] The region extraction method according to claim 10, wherein the step (j) is for obtaining the second contour by enlarging or reducing the first contour with a predetermined magnification.

[12] The region extraction method according to claim 10, wherein the step (j) is for obtaining the second contour by changing a position, size or shape of the element graphics that are used upon obtaining the first contour in the step (f).

[13] The region extraction method according to claim 10, wherein

the step (k) is for extracting one of only the stratified regions, a region on the side of the first contour including the stratified region or a region on the side of the second contour including the stratified region.

[14] The region extraction method for extracting a specified region in an image including:

(l) a step for displaying the image;

(m) a step for selecting a desired region in the image;

(n) a step for extracting one or more partial regions from the desired region;

(o) a step for combining the one or more partial regions and synthesizing at least parts of the desired region; and

(p) a step for making at least a partial contour of the desired region of at least the partial region being synthesized as a first contour.

[15] The region extraction method according to claim 14, wherein the following steps are included after the step (p):

(q) a step for enlarging or reducing the one or more partial regions with a predetermined magnification;

(r) a step for combining the one or more enlarged or reduced partial regions, and synthesizing at least a part of the desired region being enlarged or reduced;

(s) a step for making at least a partial contour of at

least a part of the enlarged or reduced desired region as a second contour;

(t) a step for extracting a region including at least a stratified region being held between the first contour and the second contour.

[16] The region extraction method according to claim 10, in the case there is a plurality of images, wherein the following steps are included after the step (k):

(u) a step for changing the image and repeating the steps (a) ~ (k) at least twice;

(v) a step for synthesizing 3-dimensional regions using the extraction region on each of the images.

[17] The region extraction method according to claim 16, in the case that the plurality of images are tomogrpahic images being mutually different slices, wherein the following step is included between the steps (u) and (v):

(w) a step for obtaining the first contour, the second contour and the stratified region, of the region where the first contour was not able to be obtained, based on the first contour in the slice of which the first contour was able to be obtained.

[18] The region extraction method according to claim 16, in the case that the plurality of images are the tomographic images being mutually different slices, wherein the following step is

included between the steps (u) and (v):

(x) a step for obtaining the stratified region of the region where the stratified region was not obtained, based on the stratified region in the slice of which the stratified region was obtained.

[19] A region extraction device comprising:

a display means for displaying an image;

an input means for receiving the command relating to the image; and

a calculating means for executing a desired image processing relating to the image, wherein:

the display means displays a plurality of element graphics along with the image;

the input means receives the command for approximating at least a partial contour of the respective element graphics to at least a partial contour of the desired region; and

the calculation means makes a contour by which at least a partial contour of the respective element graphics after the approximation is combined as a first contour.

[20] The region extracting device according to claim 19, wherein the calculating means obtains a second contour based on the first contour, and extracts a region including at least a stratified region held between the first and second contour.